

## ABSTRACT OF THE DISCLOSURE

Intermediate precursor compositions for use in manufacturing supported reactive catalysts having a controlled coordination structure, and methods for manufacturing such precursor compositions are disclosed. The precursor compositions include a catalyst complex formed from catalyst atoms and a control agent that is applied to a substrate. Reduction of the catalyst complex yields supported reactive catalyst in which a preponderance of the top or outer layer of atoms of the catalyst particles exhibit a controlled coordination number of 2. The supported catalysts are useful for a variety of chemical reactions, including the preparation of hydrogen peroxide with high selectivity.

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